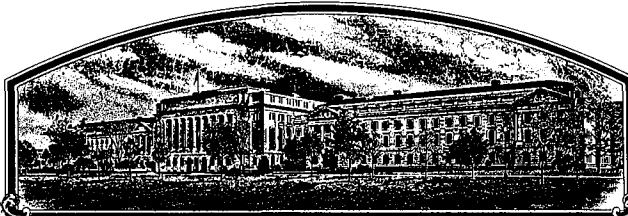


No.

9100070



# THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

**Golden's Foundation Seeds, Inc.**

Whereas, THERE HAS BEEN PRESENTED TO THE  
**Secretary of Agriculture**

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED NOVEL VARIETY OF SEXUALLY REPRODUCED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF *eighteen* YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, IMPORTING IT, OR EXPORTING IT, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT (T. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

CORN

'LH212Ht'

In Testimony Whereof, I have hereunto set  
my hand and caused the seal of the Plant  
Variety Protection Office to be affixed  
at the City of Washington, D.C.  
this 31st day of December in  
the year of our Lord one thousand nine  
hundred and ninety-two.

Attest:

*Kenneth A. Kiv...*  
Commissioner  
Plant Variety Protection Office  
Agricultural Marketing Service

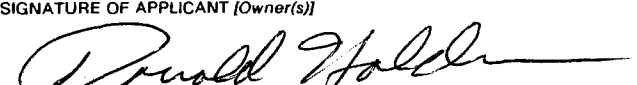
*Lawrence M. Dign...*  
Secretary of Agriculture

U.S. DEPARTMENT OF AGRICULTURE  
AGRICULTURAL MARKETING SERVICE

# APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

(Instructions on reverse)

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

<b>1. NAME OF APPLICANT(S) (as it is to appear on the Certificate)</b>  Holden's Foundation Seeds, Inc.		<b>2. TEMPORARY DESIGNATION OR EXPERIMENTAL NO.</b>  Ex2001	<b>3. VARIETY NAME</b>  LH212 Ht
<b>4. ADDRESS (street and no. or R.F.D. no., city, state, and ZIP)</b>  P.O. Box 839 201 North Maplewood Avenue Williamsburg, Iowa 52361		<b>5. PHONE (include area code)</b>  319-668-1100	
<b>6. GENUS AND SPECIES NAME</b>  Zea mays		<b>7. FAMILY NAME (Botanical)</b>  Gramineae	
<b>8. CROP KIND NAME (Common Name)</b>  Corn, Field		<b>9. DATE OF DETERMINATION</b>  November 1989	
<b>10. IF THE APPLICANT NAMED IS NOT A "PERSON," GIVE FORM OF ORGANIZATION (Corporation, partnership, association, etc.)</b>  Corporation			
<b>11. IF INCORPORATED, GIVE STATE OF INCORPORATION</b>  Iowa		<b>12. DATE OF INCORPORATION</b>  1968	
<b>13. NAME AND ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS</b>  Mr. Mark Armstrong P.O. Box 839 Williamsburg, Iowa 52361			
PHONE (include area code): (319) 668-1100			
<b>14. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED (Follow INSTRUCTIONS on reverse)</b>			
a. <input checked="" type="checkbox"/> Exhibit A, Origin and Breeding History of the Variety.			
b. <input checked="" type="checkbox"/> Exhibit B, Novelty Statement.			
c. <input checked="" type="checkbox"/> Exhibit C, Objective Description of Variety.			
d. <input checked="" type="checkbox"/> Exhibit D, Additional Description of Variety.			
e. <input checked="" type="checkbox"/> Exhibit E, Statement of the Basis of Applicant's Ownership.			
f. <input checked="" type="checkbox"/> Seed Sample (2,500 viable untreated seeds). Date Seed Sample mailed to Plant Variety Protection Office <u>1/11/91</u>			
g. <input checked="" type="checkbox"/> Filing and Examination Fee (\$2,150) made payable to "Treasurer of the United States."			
<b>15. DOES THE APPLICANT(S) SPECIFY THAT SEED OF THIS VARIETY BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED? (See section 83(a) of the Plant Variety Protection Act.)</b> <input type="checkbox"/> YES (If "YES," answer items 16 and 17 below) <input checked="" type="checkbox"/> NO (If "NO," skip to item 18 below)			
<b>16. DOES THE APPLICANT(S) SPECIFY THAT THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS?</b>  <input type="checkbox"/> YES <input type="checkbox"/> NO		<b>17. IF "YES" TO ITEM 16, WHICH CLASSES OF PRODUCTION BEYOND BREEDER SEED?</b>  <input type="checkbox"/> FOUNDATION <input type="checkbox"/> REGISTERED <input type="checkbox"/> CERTIFIED	
<b>18. DID THE APPLICANT(S) PREVIOUSLY FILE FOR PROTECTION OF THE VARIETY IN THE U.S.?</b>  <input checked="" type="checkbox"/> YES (If "YES," through <input type="checkbox"/> Plant Variety Protection Act <input checked="" type="checkbox"/> Patent Act. Give date: <u>12/3/90</u> ) <input type="checkbox"/> NO			
<b>19. HAS THE VARIETY BEEN RELEASED, USED, OFFERED FOR SALE, OR MARKETED IN THE U.S. OR OTHER COUNTRIES?</b>  <input type="checkbox"/> YES (If "YES," give names of countries and dates) <input checked="" type="checkbox"/> NO			
<b>20. The applicant(s) declare(s) that a viable sample of basic seeds of this variety will be furnished with the application and will be replenished upon request in accordance with such regulations as may be applicable.</b>  The undersigned applicant(s) is (are) the owner(s) of this sexually reproduced novel plant variety, and believe(s) that the variety is distinct, uniform, and stable as required in section 41, and is entitled to protection under the provisions of section 42 of the Plant Variety Protection Act.  Applicant(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.			
SIGNATURE OF APPLICANT [Owner(s)]  		CAPACITY OR TITLE  President	
SIGNATURE OF APPLICANT [Owner(s)]		CAPACITY OR TITLE	
DATE  1/11/91		DATE  1	

## Exhibit A

## ORIGIN AND BREEDING HISTORY OF THE INBRED

Before the development of LH212<sup>Ht</sup> was initiated, the single cross LH24 x LH123Ht was backcrossed with LH123Ht. This combination, LH123Ht<sup>2</sup> x LH24, was then selfed and the pedigree system of plant breeding used in the development of LH212<sup>Ht</sup>. LH24 and LH123Ht, the progenitors of LH212<sup>Ht</sup>, are both proprietary lines of Holden's Foundation Seeds, Inc. On the following pages are a summary and description of the development of LH212<sup>Ht</sup>. Also included are copies of pages from the nursery books of Holden's Foundation Seeds, Inc. The rows associated with the development of LH212<sup>Ht</sup> have been highlighted. It is important to note that LH123Ht was the actual inbred used in the development of LH212<sup>Ht</sup>. There is only one version of LH123Ht and it is a protected corn inbred under a Plant Variety Protection Certificate No. 8400030. The Ht designation was dropped in the nursery book for convenience.

Attached is a statement from the originating plant breeder, Terry Foley, stating that the line is uniform, stable, and free of variance from within the population.

JMS  
12/4/92

Origin and Breeding History of the Inbred  
 $LH212^{Ht} = Ex2001 = LH123)^2 \times LH24$

## Exhibit A

<u>FIELD/ROW</u>	<u>PEDIGREE</u>	<u>LOCATION</u>	<u>YEAR</u>
Colony	LH212 <sup>Ht</sup>	Iowa	1990
Helm	LH212 <sup>Ht</sup>	Hawaii	1989-90
6090-6099	Ex2001	Iowa	1989
11070	Ex2001	Hawaii	1988-89
8889	LH123(2) x LH24 @7	Iowa	1988
16468	LH123(2) x LH24 @6	Hawaii	1987-88
20475	LH123(2) x LH24 @5	Iowa	1987
23570	LH123(2) x LH24 @4	Iowa	1986
5358	LH123(2) x LH24 @3	Hawaii	1985-86
25282	LH123(2) x LH24 @2	Iowa	1985
3147	LH123(2) x LH24 @1	Hawaii	1984-85
2657	LH24 x LH123)(LH123	Hawaii	1984
1246	LH24 x LH123	Hawaii	1984
1247	LH123		
3402	LH24		
3919	LH123	Hawaii	1983-84

Exhibit A: The selection criteria used during the development of LH212<sup>Ht</sup> were yield, stalk quality, root quality, disease tolerance, late plant greenness, late plant intactness, ear retention, pollen shedding ability, silking ability and corn borer tolerance.

## UNIFORMITY STATEMENT

I have observed LH212<sup>HC</sup> during the last four generations it has been increased: 1988-89 Hawaii nursery row 11070; 1989 Iowa nursery rows 6090-6099; 1989-90 Hawaii, Helm production field; and 1990 Iowa, Colony production field. In each of these increases seeds from the previous generation were planted. The line is very stable and uniform from generation to generation. The line is also free of variance from within the population.

  
Terry Foley  
Plant Breeder

### Novelty Statement

#### Exhibit B

LH212Ht most closely resembles LH123Ht. However, the most distinguishing characteristic is glume color. The glume color of LH212Ht is purple, while the glume color of LH123Ht is green.

OBJECTIVE DESCRIPTION OF VARIETY  
CORN (ZEA MAYS)

NAME OF APPLICANT(S) Holden's Foundation Seeds, Inc. ADDRESS (Street and No. or R.F.D. No., City, State, and ZIP Code) P.O. Box 839 201 N. Maplewood Ave. Williamsburg, Iowa 52361	FOR OFFICIAL USE ONLY PVPO NUMBER 9100070 VARIETY NAME OR TEMPORARY DESIGNATION LH212Ht JM 12/4
---	---

Place the appropriate number that describes the varietal character of this variety in the boxes below.  
Place a zero in first box (e.g., 0 8 9 or 0 9 ) when number is either 99 or less or 9 or less.

## 1. TYPE:

2

1 = SWEET

2 = DENT

3 = FLINT

4 = FLOUR

5 = POP

6 = ORNAMENTAL

## 2. REGION WHERE BEST ADAPTED IN THE U.S.A.:

7

1 = NORTHWEST

2 = NORTHCENTRAL

3 = NORTHEAST

4 = SOUTHEAST

5 = SOUTHCENTRAL

6 = SOUTHWEST

7 = MOST REGIONS

## 3. MATURITY (In Region of Best Adaptability):

(Under "comments" (pg. 3) state how  
heat units were calculated)

9 8

DAYS FROM EMERGENCE TO 50% OF PLANTS IN SILK

1 6 3 6

HEAT UNITS

0 0

DAYS FROM 50% SILK TO OPTIMUM EDIBLE QUALITY

0 0 0 0

HEAT UNITS

0 0

DAYS FROM 50% SILK TO HARVEST AT 25% KERNEL MOISTURE

0 0 0 0

HEAT UNITS

## 4. PLANT:

2 1 9

CM. HEIGHT (To tassel tip)

0 8 1

CM. EAR HEIGHT (To base of top ear)

1 7

CM. LENGTH OF TOP EAR INTERNODE

## Number of Tillers:

1

1 = NONE

2 = 1-2

3 = 2-3

4 = &gt; 3

## Number of Ears Per Stalk:

3

1 = SINGLE 2 = SLIGHT TWO-EAR TENDENCY

3 = STRONG TWO-EAR TENDENCY 4 = THREE-EAR TENDENCY

## Cytoplasm Type:

1

1 = NORMAL

2 = "T"

3 = "S"

4 = "C"

5 = OTHER (Specify)

## 5. LEAF (Field Corn Inbred Examples Given):

## Color:

\*5GY 4/4 Munsell Color Charts for Plant Tissues

3\*

1 = LIGHT GREEN (HY)

2 = MEDIUM GREEN (WF9)

3 = DARK GREEN (B14)

4 = VERY DARK GREEN (K16)

## Angle from Stalk (Upper half):

2

1 = &lt; 30°

2 = 30-60°

3 = &gt; 60°

## Sheath Pubescence:

2

1 = LIGHT (W22)

2 = MEDIUM (WF9)

3 = HEAVY (OH26)

## Marginal Waves:

2

1 = NONE (HY)

2 = FEW (WF9)

3 = MANY (OH7L)

## Longitudinal Creases:

2

1 = ABSENT (OH51)

2 = FEW (OH56A)

3 = MANY (PA11)

## Width:

0 9

CM. WIDEST POINT OF EAR NODE LEAF

## Length:

0 7 8

CM. EAR NODE LEAF

1 2

NUMBER OF LEAVES PER MATURE PLANT

## 6. TASSEL:

0 5

NUMBER OF LATERAL BRANCHES

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Branch Angle from Central Spike:

2

1 = &lt; 30°

2 = 30-40°

3 = &gt; 45°

Penduncle Length:

1 1

CM. FROM TOP LEAF TO BASAL BRANCHES

Pollen Shed:

2

1 = LIGHT (WF9)

2 = MEDIUM

3 = HEAVY (KY21)

1\*

Anther Color:

1 = YELLOW

2 = PINK

3 = RED

4 = PURPLE

5 = GREEN

Glume Color:

6 = OTHER (Specify)

\*brown after dehiscence

Pollen Restoration for Cytoplasm (0 = Not Tested, 1 = Partial, 2 = Good)

0

"T"

0

"S"

0

"C"

0

OTHER (Specify Cytoplasm and degrees of restoration)

## 7. EAR (Husked Ear Data Except When Stated Otherwise):

1 6

CM LENGTH

4 2

MM. MID-POINT  
DIAMETER

9 6

GM. WEIGHT

Kernel Rows:

2

1 = INDISTINCT

2 = DISTINCT

1 4

NUMBER

3

1 = STRAIGHT

2 = SLIGHTLY CURVED

3 = SPIRAL

Silk Color (Exposed at Silking Stage):

1

1 = GREEN

2 = PINK

3 = SALMON

4 = RED

Husk Color:

1

FRESH

1 = LIGHT GREEN

2 = DARK GREEN

3 = PINK

6

DRY

4 = RED

5 = PURPLE

6 = BUFF

Husk Extention: (Harvest Stage)

2

1 = SHORT (Ears Exposed) 2 = MEDIUM (Barely Covering Ear)

3 = LONG (8-10CM Beyond Ear Tip)

4 = VERY LONG (&gt; 10 CM)

Husk Leaf:

1

1 = SHORT (&lt; 8 CM)

2 = MEDIUM (8-15 CM)

3 = LONG (&gt; 15 CM)

Shank:

0 9

CM LONG

9

NO. OF INTERNODES

Position at Dry Husk Stage:

1

1 = UPRIGHT

2 = HORIZONTAL

3 = PENDENT

Taper:

2

1 = SLIGHT

2 = AVERAGE

3 = EXTREME

Drying Time (Unhusked Ear):

2

1 = SLOW

2 = AVERAGE

3 = FAST

## 8. KERNEL (Dried):

Size (From Ear Mid-Point):

1 1

MM LONG

0 9

MM. WIDE

0 4

MM. THICK

Shape Grade (% Rounds)

2

1 = &lt; 20

2 = 20-40

3 = 40-60

4 = 60-80

5 = &gt; 80



## 8. KERNEL (Dried) :

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8 Pericarp Color: 1 = COLORLESS 2 = RED-WHITE CROWN 3 = TAN 4 = BRONZE  
 5 = BROWN 6 = LIGHT RED 7 = CHERRY RED  
 8 = VARIEGATED (Describe) colorless at crown and becomes more bronze down to the pedicel

1 Aleurone Color: 1 = HOMOZYGOUS 2 = SEGREGATING (Describe) \_\_\_\_\_

1 1 = WHITE 2 = PINK 3 = TAN 4 = BROWN 5 = BRONZE 6 = RED  
 7 = PURPLE 8 = PALE PURPLE 9 = VARIEGATED (Describe) \_\_\_\_\_

3 Endosperm Color: 1 = WHITE 2 = PALE YELLOW 3 = YELLOW 4 = PINK-ORANGE 5 = WHITE CAP.

## Endosperm Type:

3 1 = SWEET (su1) 2 = EXTRA SWEET (sh2) 3 = NORMAL STARCH 4 = HIGH AMYLOSE STARCH  
 5 = WAXY STARCH 6 = HIGH PROTEIN 7 = HIGH LYSINE 8 = OTHER (Specify) \_\_\_\_\_

2 3 GM. WEIGHT /100 SEEDS (Unsize Sample)

## 9. COB:

3 3 MM. DIAMETER AT MID-POINT

## Strength:

2 1 = WEAK 2 = STRONG

## Color:

3 1 = WHITE 2 = PINK 3 = RED 4 = BROWN  
 5 = VARIEGATED 6 OTHER (Specify) \_\_\_\_\_

## 10. DISEASE RESISTANCE (0 = Not Tested, 1 = Susceptible, 2 = Resistant):

5/15 12/4/92 2 0 STALK ROT (Diplodia) 0 STALK ROT (Fusarium) 0 STALK ROT (Gibberella)  
 0 NORTHERN LEAF BLIGHT *H. turcicum race 1* 0 SOUTHERN LEAF BLIGHT 0 SMUT  
 0 SOUTHERN RUST 0 CORN SMUT 0 BACTERIAL WILT  
 0 BACTERIAL LEAF BLIGHT 0 MAIZE DWARF MOSAIC 0 STUNT  
 0 OTHER (Specify) \_\_\_\_\_

## 11. INSECT RESISTANCE (0 = Not Tested, 1 = Susceptible, 2 = Resistant):

0 CORNBORER 0 EARWORM 0 SAPBEETLE 0 APHID  
 0 ROOTWORM (Northern) 0 ROOTWORM (Western)  
 0 ROOTWORM (Southern) 0 OTHER (Specify) \_\_\_\_\_

## 12. VARIETIES MOST CLOSELY RESEMBLING THAT SUBMITTED FOR THE CHARACTERS GIVEN:

CHARACTER	VARIETY	CHARACTER	VARIETY
Maturity	LH123Ht	Kernel Type	LH123Ht
Plant Type	LH123Ht	Quality (Edible)	
Ear Type	LH123Ht	Usage	LH123Ht

## REFERENCES:

U.S. Department Agriculture. Yearbook 1937.  
 Corn: Culture, Processing, Products. 1970 Avi Publishing Company, Westport, Connecticut. (Numerous (Authors)  
 Emerson, R.A., G.W. Beadle, and A.C. Fraser. A Summary of Linkage Studies in Maize. Cornell A.E.S., Mem. 180. 1935.  
 The Mutants of Maize. 1968. Crop Science Society of America. Madison, Wisconsin.  
 Stringfield, G.H. Maize Inbred Lines of Ohio, Ohio A.E.S. Bul. 831. 1959.  
 Butler, D.R. 1954 - A System for the Classification of Corn Inbred Lines - PhD. Thesis, Ohio State University.

## COMMENTS:

$$GDD = \frac{T_{max} + T_{min}}{2} - 50^{\circ} F \quad \begin{matrix} T_{max} \leq 86^{\circ} F \\ T_{min} \geq 50^{\circ} F \end{matrix}$$

8

## Exhibit D

## ADDITIONAL DESCRIPTION OF THE INBRED

LH212<sup>Ht</sup> is a medium maturity field corn inbred. It flowers approximately two to three days earlier than LH123Ht. LH212<sup>Ht</sup> appears to have a strong two-ear tendency while LH123Ht has a single-ear tendency.

The lateral tassel branches of LH212<sup>Ht</sup> are not erect. They tend to droop or "flatten out." LH212<sup>Ht</sup> does appear to be a good pollinator and could possibly be used as a seed parent. The majority of the kernels under favorable growing conditions would probably be in the flat sizes with fewer in the round sizes.

JMS  
12/4/92

LH212<sup>Ht</sup> hybrids are slightly later than LH51 hybrids, but slightly earlier than LH123Ht hybrids and have excellent yield potential. The standability of LH212<sup>Ht</sup> hybrids appears to be slightly better than LH51 hybrids.

Exhibit ~~X~~ D

## NOVELTY STATEMENT

LH212<sup>ht</sup> most closely resembles LH123Ht; however, the most distinguishing characteristic is post dehiscent anther color. When the anthers of LH212<sup>ht</sup> first emerge from the glume and during dehiscence, they are yellow in color, but after dehiscence the anthers turn brown in color. The anthers of LH123Ht are yellow in color when they emerge from the glume and during dehiscence, but then after dehiscence turn colorless.

5MS  
12/4/92

The glume color of LH212<sup>ht</sup> is ~~half purple and half green~~ on the main stem of the tassel and the glume color on the lateral branches of the tassel are almost entirely purple. The glume color of LH123Ht is green. The photograph below illustrates these characteristics of LH212.



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## Exhibit E

## STATEMENT OF THE BASIS OF APPLICANT OWNERSHIP

Holden's Foundation Seeds, Inc., Williamsburg, Iowa, is the sole owner and breeder of  
the LH212<sup>HT</sup> corn inbred line for which it solicits a certificate of protection.

SMS  
12/4/92